Academic Program Review

ACADEMIC YEAR	2013-2014	☒ Basic Skills ☒ Transfer ☐ Career Technical Education (CTE)
PROGRAM	Mathematics	
DEPARTMENT	Science, Math, and Engineering	
DIVISION	Health and Science	
SUBMITTER	Rick Castrapel	

I. INSTITUTIONAL GOALS

INSTITUTIONAL GOAL **1**	**INSTITUTIONAL MISSION AND EFFECTIVENESS** – The College will maintain programs and services that focus on the mission of the College supported by data-driven assessments to measure student learning and student success.
INSTITUTIONAL GOAL **2**	**STUDENT LEARNING PROGRAMS AND SERVICES** – The College will maintain instructional programs and services which support student success and the attainment of student educational goals.
INSTITUTIONAL GOAL **3**	**RESOURCES** – The College will develop and manage human, technological, physical, and financial resources to effectively support the College mission and the campus learning environment.
INSTITUTIONAL GOAL **4**	**LEADERSHIP AND GOVERNANCE** – The Board of Trustees and the Superintendent/President will establish policies that assure the quality, integrity, and effectiveness of student learning programs and services, and the financial stability of the institution.

II. PROGRAM GOALS

A. PAST – EVALUATION OF PREVIOUS CYCLE OBJECTIVES/PROGRAM GOALS (SET IN PREVIOUS YEAR)

List your previous objectives/goals and associated Institutional Goals. All program goals must address at least one of the institutional goals.

PAST PROGRAM GOALS (Describe past program goals.)	INSTITUTIONAL GOAL(S) (Check all that apply.)

1	PAST PROGRAM GOAL #1	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: Math Lab needs updated computers. Math Lab needs student (peer) tutors.	☒ 1 ☒ 2 ☒ 3 ☐ 4
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Math Lab computers have all been updated to new models. Additional funding for peer tutors has been found through a ASG grant and through a new IVC Foundation account that allows staff to earmark their donations specifically for the Math Lab.	

2	PAST PROGRAM GOAL #2	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: Math Dept. is unable to meet the demand for certain classes (developmental math and statistics) because we need another FT faculty. Jill Nelipovich has become Institutional Researcher and is not teaching any math classes. Eric Lehtonen is 75% reassigned.	☒ 1 ☒ 2 ☒ 3 ☒ 4
	☐ Met ☒ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Jill Nelipovich has returned to FT math faculty. Eric Lehtonen's term as AS President will be ending with this academic year. Some of the pressure on Statistics classes has been eased by the Psychology program beginning to offer their own Statistics course. Demand for developmental math classes appears to be easing. We believe this to be a result of the realignment of developmental math courses done in 2010, reducing the repeat rates for these courses.	

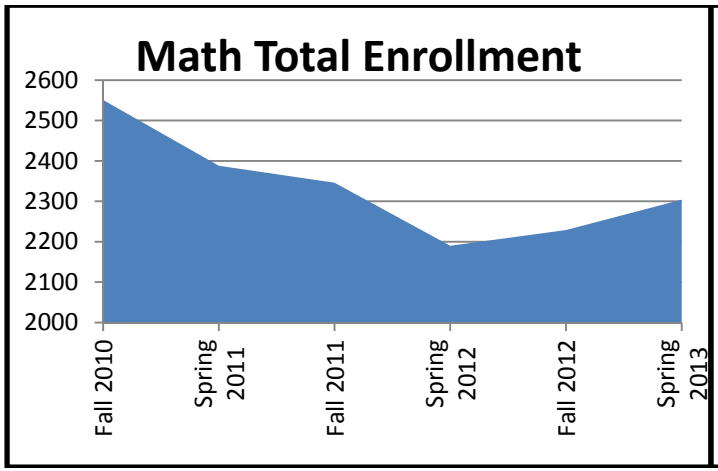
3	PAST PROGRAM GOAL #3	INSTITUTIONAL GOAL(S)
	Identify Program Goal from Last Program Review: If and when the State mandates that math 61, 71, and 81 become non-credit, we will be able to meet some of our need with new PT faculty. We need at least a FT faculty split 50% engineering and 50% math.	☒ 1 ☒ 2 ☒ 3 ☒ 4
	☐ Met ☐ Partially Met ☒ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** Math 61, 71 and 81 are still credit courses at this time, requiring fully qualified faculty. There is a lack of a qualified applicant pool of PT math faculty in the Imperial Valley. Some of our current PT faculty would need to pass equivalence today. No new faculty has been hired for math or engineering.	

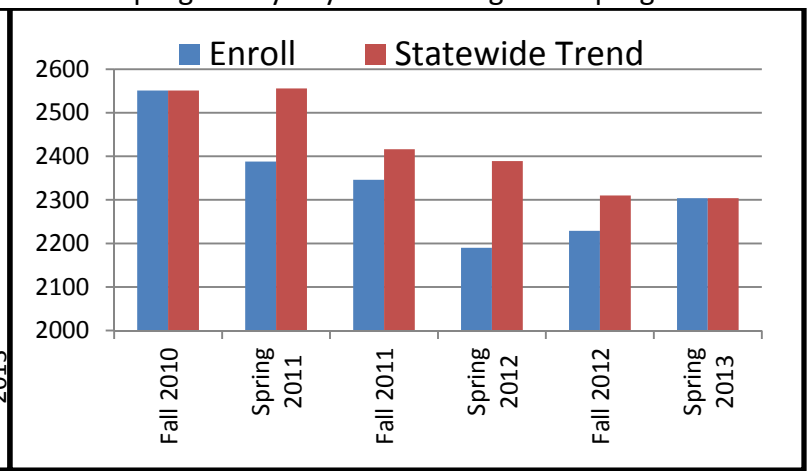
Comments:

B. PRESENT – DATA ANALYSIS AND PROGRAM HEALTH

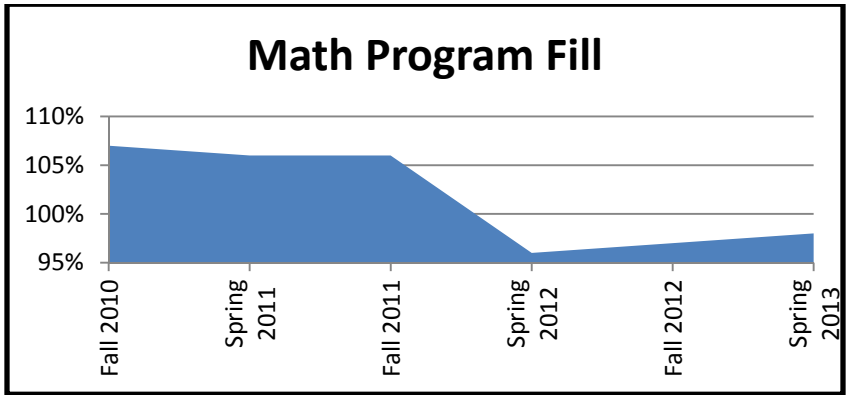
1. Summarize and analyze all disaggregated data by day, evening, gender, ethnicity, and distance education regarding enrollments, fill rates, productivity, completion, success, retention, persistence, and transfer (complete a, b, & c). ***Attach graphs or trend data***.

   a. Discuss and chart the trends in enrollment and fill rate for each program by day and evening at the program level.



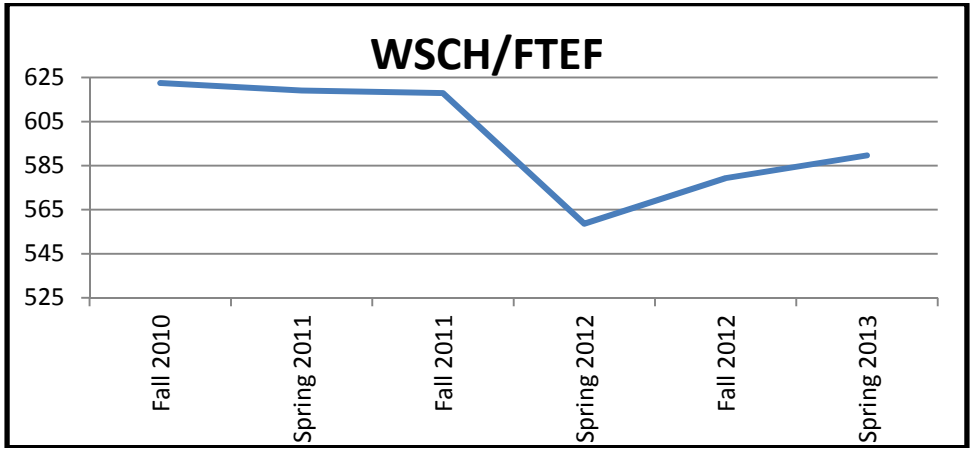


Total enrollment in math classes has dropped in line with the total statewide community college enrollment drop. Both now appear to be leveling off.



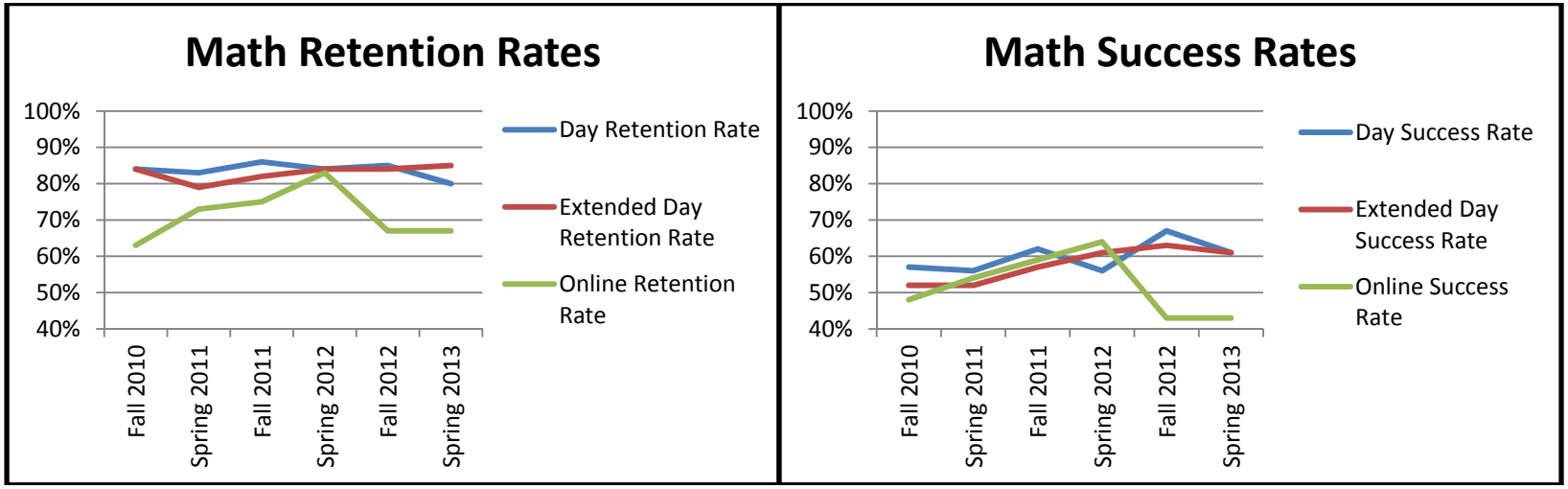
Fill rates have dropped below 100% in recent semesters as we adjust the math schedule to reflect changes in student demand for fewer developmental course repeats and more higher level courses.

b. What are the trends in productivity? (WSCH/FTEF) The goal is 525 as per state guidelines. A low number means that we are below target levels for productivity. For example, in a small class that has a mandated cap of 15 students, the fill rate may be 100% but the productivity number (WSCH/FTEF) will be very low. A class with a cap of 40 students with a 100% fill rate will have a productivity number close to or above 525.



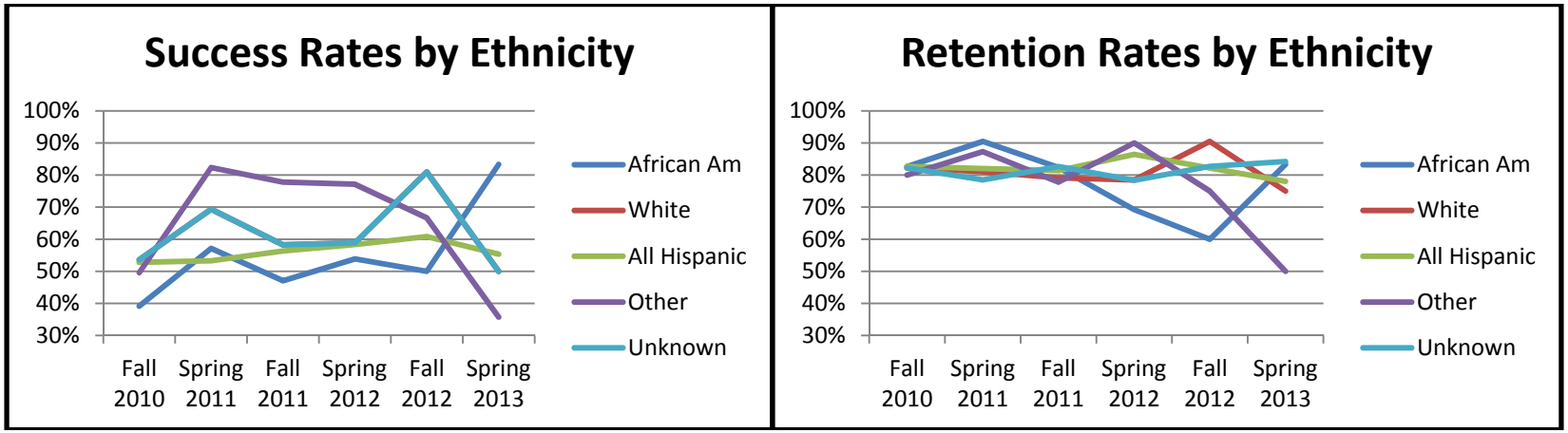
Productivity is in line with fill rates and remains high throughout the program as all math classes have quotas of at least 30 and nearly all have quotas of 35.

c. Discuss and chart the success and retention rates by day, evening (extended day), and online classes in each program and identify gaps.



Success and retention rates are in line with expected. Note: No online math classes were offered in Spring 2013.

d. Discuss and chart the success and retention rates in each program and identify gaps for five ethnic groups. (African-American, White, all Hispanics, Other, Unknown).



Comparison of the trend lines on these charts is meaningless because the "All Hispanic" category (green line) is nearly 90% of all

the data. Thus the green lines for success and retention rates appear stable and consistent with statewide rates. The other lines gyrate widely because of small sample size.

e. Discuss the trends in the number of degrees or certificates awarded, if applicable. (You may be able to expand more about this in B.3 below.)

Number of Degrees and Certificates Awarded 2010-2011 through 2012-2013 (3 years)

Degrees	Awarded			Awarded
A.S. Mathematics	35			35
AS-T Mathematics for Transfer	10			10

While the Mathematics Department serves almost all students, most students take mathematics courses as part of another program.

f. What program changes, if any, will you recommend that you expect would have a positive effect on your students in your program, if applicable?

We would like to see more emphasis on development of students for transfer to educational programs which will lead to employment in the Imperial Valley. In particular, demand for various engineering fields in the Valley is high. IVC has received a $375,000 endowment from First Solar, with more to come, specifically earmarked to develop engineers in the Valley.

2. Summarize revisions, additions, deletions, or alternate delivery methods to courses and/or program based on the last program review.

In 2010 we expanded the developmental math sequence from three courses to four and from 10 units to 15. It was hoped that these changes would lead to an increase in student success, eventually reducing the demand. We have indeed seen a recent trend for less demand for math 91 in particular. There are three potential reasons for this: 1) better success rates due to the increase in units; 2) generally lower enrollment at IVC; 3) the increase in exit points in the developmental math sequence.

The IVC Math Dept. is reviewing the success of the 2010 sequence change. We may offer a combined math61/math71 to reduce the

number of exit points. We are now offering Math 91 and Math 119 sections online. We will be developing a Math 81 online for delivery in Spring 2015.

3. Evaluate the program's viability by addressing program completion, size (FTES), projections (growing/stable/declining), and quality of outcomes.
   For CTE programs, also include labor market projections, placement, and performance on external testing/exams (i.e. ASE, NABCEP) and industry-recognized credentials, placement, and performance on external testing or exams (NCLEX, ASC, NAP).

   The math program is more than viable and sustainable with Fill Rates 95%-105%, WSCH:FTEF 558-589 in past 3 semesters, and a positive direction in FTES returning. MATH degree completion of 35 is fairly good and MATH AS-T completions of 10 is excellent considering the limited time the AS-T has been available.

C. FUTURE – LIST OF "SMART" (SPECIFIC MEASURABLE ATTAINABLE RELEVANT TIME-LIMITED) PROGRAM OBJECTIVES FOR NEXT ACADEMIC YEAR TO ADDRESS PROGRAM IMPROVEMENT, GROWTH, OR UNMET NEEDS/GOALS. ALL PROGRAM GOALS MUST ADDRESS AT LEAST ONE OF THE INSTITUTIONAL GOALS.

FUTURE PROGRAM GOALS (Describe future program goals. List in order of budget priority.)	INSTITUTIONAL GOAL(S) (Check all that apply.)

1	FUTURE PROGRAM GOAL #1 Budget Priority #1	INSTITUTIONAL GOAL(S)
Identify Goal: Replace Retiring Faculty		☒ 1
Objective : Replace Barbara Nilson, project to replacing Betsy Riehle		☒ 2
Task(s):		☒ 3
Timeline: Immediate		☐ 4

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☐ One-Time ☒ Recurring	☐ Categorical Specify:	☐ General Fund	☐ Facilities ☐ Marketing ☐ Technology ☐ Professional Development ☒ Staffing	$130,000

2	FUTURE PROGRAM GOAL #2 Budget Priority #2	INSTITUTIONAL GOAL(S)
Identify Goal: Expand hybrid math classroom opportunities and make easier access to the Math Lab.		☒ 1 ☒ 2 ☒ 3 ☐ 4
Objective: Increase student success in developmental classes.		
Task(s): Move Math Lab closer to math classrooms. Create a computer classroom for hybrid classes.		
Timeline: Two Years		

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☒ One-Time ☐ Recurring	☐ Categorical Specify:	☒ General Fund	☒ Facilities ☐ Marketing ☒ Technology ☐ Professional Development ☐ Staffing	$100,000

3	FUTURE PROGRAM GOAL #3 Budget Priority #3	INSTITUTIONAL GOAL(S)
Identify Goal: Resurrect the Pre-engineering program		☒ 1 ☒ 2 ☒ 3 ☐ 4
Objective: Create AS-T future engineers to meet the local demand		
Task(s): Hire 50/50 Math and Engineering faculty member Rebuild pre-engineering program Develop partnerships with SDSU and/or CETYS Recruit students with First Solar scholarships		
Timeline: two years		

EXPENSE TYPE	FUNDING TYPE		RESOURCE PLAN (Check all that apply.)	BUDGET REQUEST
☐ One-Time ☒ Recurring	☐ Categorical Specify:	☒ General Fund	☒ Facilities ☒ Marketing ☒ Technology ☐ Professional Development ☒ Staffing	$100,000

TOTAL BUDGET REQUEST	$330,000

1. How will your enhanced budget request improve student success?

The replacement instructors and the hybrid classroom will enable the IVC Math Dept to better serve all of our students, particularly those at the developmental math levels. The pre-engineering program will enable students to pursue a high-paid, high-demand career locally.

Comments:

III. INSTITUTIONAL STUDENT LEARNING OUTCOMES (ISLOs)

ISLO 1	COMMUNICATION SKILLS
ISLO 2	CRITICAL THINKING SKILLS
ISLO 3	PERSONAL RESPONSIBILITY
ISLO 4	INFORMATION LITERACY
ISLO 5	GLOBAL AWARENESS

IV. PROGRAM LEARNING OUTCOMES (PLOs)

PROGRAM LEARNING OUTCOMES (Describe learning outcomes.)	**ISLO(S)** [Link PLO to appropriate ISLO(s).]

PLO 1	**PROGRAM LEARNING OUTCOME #1**	**ISLO(S)**
	Identify Program Outcome: Students will use mathematical reasoning to solve problems and a generalized problem solving process to work word problems.	☒ ISLO 1 ☒ ISLO 2 ☒ ISLO 3 ☒ ISLO 4 ☒ ISLO 5
	Measurable Outcome Summary: A total of 36 Calculus I students were assessed. 42% showed complete understanding of the concept, another 33% showed partial understanding, and 25% showed little or no understanding.	
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** The results of PLO1 showed that the majority of the students had met course competencies. No need for changes at this time.	

PLO 2	PROGRAM LEARNING OUTCOME #2	ISLO(S)
	Identify Program Outcome: Students will learn mathematics through modeling real-world situations.	☒ ISLO 1 ☒ ISLO 2 ☒ ISLO 3 ☒ ISLO 4 ☒ ISLO 5
	Measurable Outcome Summary: This PLO was assessed by having Statistics (MATH 119) students use technology to analyze data using binomial distribution. The results of the project are as follows out of 58 students:33% received grade of A, 24% received grade of B, 22% received grade of C, and 21% received no passing grade.	
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** The results of PLO 2 showed that the majority of the students had met course competencies. No need for changes at this time	

PLO 3	PROGRAM LEARNING OUTCOME #3	ISLO(S)
	Identify Program Outcome: Students will use appropriate technology to enhance their mathematical thinking and understanding, solve mathematical problems, and judge the reasonableness of their results.	☒ ISLO 1 ☒ ISLO 2 ☒ ISLO 3 ☒ ISLO 4 ☒ ISLO 5
	Measurable Outcome Summary: One Calculus I (MATH 192) classes participated in a project involving using MATLAB(mathematical software) and Newton's Method in order to find root of a given polynomial. 14 students were assessed, 58% showed complete understanding of the concept, another 21% showed partial understanding and 31% showed little or no understanding.	
	☒ Met ☐ Partially Met ☐ Not Met **Provide detail on any improvements/effectiveness and detail status on those not fully met:** The results of PLO3 showed that the majority of the students had met course competencies. No changes were discussed.	

Course	# Credits	# SLOs Identified	SLOs in CurricUNET	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Spring 2014
CS 170	3	3	Yes		1		2,3		
CS 220	4	4	Yes		1	2	3,4	1,2	
CS 230	4	4	Yes		1		2,3,4		
CS 280	4	4	Yes	1		2		3,4	
ENGR 210	3	3	Yes						
ENGR 212	3	3	Yes						
ENGR 240	3	3	Yes						
MATH 060	1	1	No			1		1	
MATH 061	3	3	Yes			1		1	
MATH 071	3	3	Yes	1 (70)		3			1
MATH 081	4	4	Yes	3 (80)		1		1,2	
MATH 091	5	5	Yes			2			1,2
MATH 110	3	3	Yes	1	3	3	2	1	
MATH 112	3	3	Yes	1			2,3		1
MATH 114	1	1	Yes	1	1	1		1	
MATH 119	4	4	Yes	4		2,3	1	1,2	
MATH 122	3	3	Yes						
MATH	3	3	Yes		2		1,3		1

140									
MATH 150	4	4	Yes	3,4		1		1,2	
MATH 170	4	4	Yes		2,3		1,4		1.2
MATH 190	5	5	Yes	1,2		3,4	5		1,2
MATH 192	5	5	Yes	4		4,5	1,2	1,2	
MATH 194	5	5	Yes		1,2	3	4,5		1,2
MATH 210	5	5	Yes		1,2		3,4,5		1,2
MATH 220	3	3	Yes		1,2		1		1
MATH 230	3	3	Yes	1,2		1,2		1	
MATH 240	3	3	Yes	1,2		1,2,3		1	
MATH 241	1	1	Yes					1	